REMARKS

The Examiner is thanked for the due consideration given the application. Attached to this paper please find a draft article by Louis Olivier et al., *Catalysis Today* (2009).

Claims 24-26 and 31-45 are pending in the application. Claims 38-45 have been withdrawn from consideration.

No new matter is believed to be added to the application by this amendment.

Art Rejections

Claims 24-26, 31-34, 36 and 37 have been rejected under 35 USC §103(a) as being unpatentable over CHEN et al. (U.S. Patent 6,187,157). Claim 35 has been rejected under 35 USC §103(a) as being unpatentable over CHEN et al. in view of HAZBUN (U.S. Patent 4,791,079).

These rejections are respectfully traversed.

The present invention pertains to an oxygen conducting membrane that includes a mixed conducting dense membrane of multimetal oxide, one surface of which is covered with dispersed particles based on magnesium oxide or noble metals. The the mixed conducting dense membrane is a layer formed from a multimetal oxide compound having a formula:

$$Ba_x\ Sr_{1-x}\ Co_{1-y}\ Fe_y\ O_{3-z}$$

where $0 \leq x \leq 1$, $0 \leq y \leq 1$, and z is a number which renders a charge of the compound neutral and which defines oxygen deficiency. See independent claim 24.

Electron photomicrographs of examples of the present invention can be seen in Figures 12 and 13 of the application, which are reproduced below.

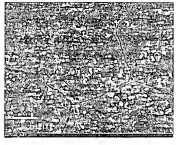

FIG.12

FIG.13

CHEN et al. pertain to multi-phase solid electrolyte ion transport membrane. Chen et al. teach an oxygen conducting membrane formed from a coupound of the formula:

$$A_x\ A'_x\ B_y\ B'_y\ O_{3-z}$$

where A is an ***lanthanide element*** and A' is a suitable lanthanide dopant element. $La_{1-x}\ Sr_x\ Co_{1-y}\ Fe_y\ O_{3-z}$ is specifically exemplified.

The Office Action asserts that the replacement of "La" by "Ba" in the above formula would occur to one of ordinary skill in the art.

The applicant respectfully disagrees. From the teachings of CHEN et al., the person of skill would replace "La" by a lanthanide element and would therefore not chose Ba, which is not a lanthanide.

Moreover, the present inventors have demonstrated that an oxygen conducting membrane exhibits ***better oxygen fluxes*** than the membranes of CHEN et al.

More precisely, the oxygen flux at 900 °C of the membrane of example 1 of CHEN et al. (Ag coated $La_{0.05}$ $Sr_{0.95}$ Co O_{3-x}) is ***2*** ml/cm^2 in (From Figure 4, for a 1 mm thickness, reproduced below) and Example 3 of CHEN et al. (50pd/50Ag coated $Ce_{0.8}$ $Gd_{0.2}$ O_{2-x}) is ***0.06*** ml/cm^2 min.

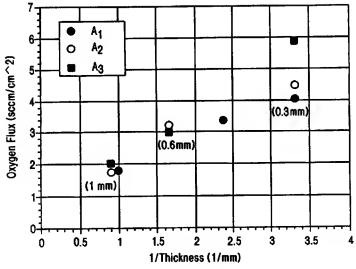

FIG. 4

Compare this to the attached article where membranes according to the present invention have been used. The oxygen flux at 900 °C of a 1 mm thick Pt/MgO coated $Ba_{0.5}$ $Sr_{0.5}$ $Co_{0.8}$ $Fe_{0.2}$

O_{3-z} membrane is ***2.84*** ml/cm^2 min (Table 1, page 3, reproduced below), which corresponsd to ***an improvement of 40% of the best oxygen flux reported by CHEN et al.***

This improvement of the oxygen flux is an ***unexpected result*** that clearly cannot be inferred from the technology of CHEN et al.

Table 1
O_2 permeation data for bare and surface-modified BSCFO membranes.

	Inlet air flow/ccm	Inlet He flow/sccm	T/°C	Mass of catalyst/mg	$J(O_2)$ ml/cm^2 min	mol/cm^2 s
BSCFO	50	100	700	0	0.44	$3.27e^{-07}$
			750	0	0.78	$5.8e^{-07}$
			800	0	1.09	$8.12e^{-07}$
			850	0	1.37	$1.02e^{-06}$
			900	0	1.70	$1.26e^{-06}$
LaSr/CaO	50	100	700	3.6	0.13	$9.69e^{-08}$
			800	5.8	0.56	$1.39e^{-06}$
			900	5.8	3.18	$2.38e^{-06}$
			950	5.8	4.30	$3.2e^{-06}$
			1000	5.8	5.52	$4.1e^{-06}$
Pt/MgO	50	100	600	7.2	1.47	$1.09e^{-06}$
			650	7.2	2.20	$1.64e^{-06}$
			800	7.2	2.84	$2.11e^{-06}$
			850	7.2	3.95	$2.95e^{-06}$
			1000	7.2	3.81	$2.83e^{-06}$
$Sr(La_2O_3$	100	100	800	8.0	0.77	$5.58e^{-07}$
			850	8.0	1.14	$8.48e^{-07}$
			900	8.0	1.97	$1.37e^{-06}$
			950	8.0	2.09	$1.46e^{-06}$
			1000	8.0	2.64	$1.97e^{-06}$

The observations above and set forth in the attached article can be re-submitted in the form of a Declaration, if the Examiner desires.

HAZBUN does not address the deficiencies of CHEN et al. disscussed above.

One or ordinary skill and creativity would thus fail to produce a claimed embodiment of the present invention from a knowledge of the applied art references. A *prima facie* case of unpatentability has thus not been made.

Further, the unexpected results of thre present invention fully rebut any unpatentability that can be alleged.

These rejections are believed to be overcome, and withdrawal thereof is respectfully requested.

Request for Rejoinder

As allowable subject matter has been indicated, rejoinder and consideration of all the claims on the merits is respectfully requested.

Conclusion

The Examiner is thanked for considering the Information Disclosure Statement filed February 27, 2006 and for making an initialed PTO-1449 Form of record in the application.

Priort art of record but not utilized is believed to be non-pertinent to the instant claims.

No issues remain. The Examiner is accordingly respectfully requested to place the application in condition for allowance and to issue a Notice of Allowability.

The Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 25-0120 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17.

Respectfully submitted,

YOUNG & THOMPSON

/Robert E. Goozner/

Robert E. Goozner, Reg. No. 42,593
209 Madison Street, Suite 500
Alexandria, VA 22314
Telephone (703)521-2297
Telefax (703)685-0573 /(703)979-4709

REG/lad

APPENDIX:

The Article by LOUIS et al., from Catalysis Today, "Oxidative coupling of methane using catalyst modified dense perovskite membrane reactors".